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CHEMICAL KILLING OF SPROUTING STUMPS

By H. D. Bruce, Chemist

After land has been cleared of shrub or tree growth by fire or cutting, species that have the capacity to sprout from the stump or base of the stem soon send up vigorous, dense, brushy growth which is objectionable from such standpoints as fire protection and improvement maintenance. Included among such sprouters in California are all the tree and scrub oaks, certain manzanita and ceanothus species, and such other native shrubs as chamise, Christmas berry, California coffee berry, sugar sumac, Sierra chinquapin, and birchleaf mountain-mahogany. Of those, highland live oak, including the tree (Quercus wislizenii) as well as the shrub form (var. frutescens), is one of the most vigorous and persistent sprouters and one of the most troublesome. This species is of common occurrence over wide areas in the foothills and mountains of California.

Several introduced trees such as eucalyptus and acacia are also vigorous sprouters and frequently present difficult control problems in both rural and urban areas.

In figure 1 is shown a typical live oak a few years after cutting. Such a bush may not only usurp valuable forage land but is always a potential fire hazard because of its inflammability and fire-spreading characteristics. It cannot be killed by chopping off the branches or by burning, for after such treatment the stump sends forth new growth from the base and becomes more voluminous and more objectionable than ever.

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The eradication of sprouting brush is a difficult problem, and considerable study has been undertaken to find a cheaper, quicker, and more positive method than blasting or grubbing. One solution of the problem has been found in poisoning with herbicidal chemicals as hereinafter described.

Of several chemicals tested extensively as a stump poison, ammonium sulfamate has proved both effective and reliable. It is a white, crystalline, water-soluble salt, which can be purchased from chemical supply houses for 18 to 20 cents per pound. It is available in small quantities at local hardware and garden supply retailers under the trade-name "Ammate." It is used as a solution (approximately 15 percent) prepared by dissolving $1\frac{1}{2}$ pounds of the salt in 1 gallon of water.

In poisoning a stump with ammonium sulfamate there are four operations, as follows:

1. Desprouting (fig. 2). All sprouts are chopped off at the crown with an axe. The purpose of desprouting is to gain access to the stump and to facilitate later operations.

2. Unearthing (fig. 3). The soil or duff immediately around the stump is removed with a shovel or mattock to a depth of 3 or 4 inches, exposing all budding tissue and any large radial roots. At the same time loose litter is removed from the top of the crown so that all live portions of the stump are clearly defined.

3. Hacking (fig. 4). All live tissue is then scarred by lightly hacking through the bark. The chips are allowed to remain in place to catch and retain the poison. It is particularly important to make a complete girdle of cuts at and below ground level where new sprouts are apt to develop. Hacking is the most important operation and should be thorough.

4. Spraying (fig. 5). The 15-percent solution of ammonium sulfamate is applied to the fresh cuts. This is done most easily by manipulating a stream of the liquid from the nozzle of a portable sprayer. Only enough solution need be applied to saturate the freshly cut surfaces.

In figure 6 is shown the dead stump after chemical treatment of the sprouting stump pictured in figure 1.

A complete kill of about 95 percent of stumps treated in this way can be expected from a single application of ammonium sulfamate. In the surviving stumps an occasional sprout will later develop but will easily succumb to a second treatment. The success from the first application falls off sharply when the stumps exceed 25 inches in diameter because the larger stumps are more irregular and more difficult to prepare. Added care in step 3, above, will result in equal success.

Six to ten stumps of average size can usually be treated with one gallon of solution. The average workman can treat from four to eight stumps an hour. There is little or no seasonal difference in the resistance or susceptibility of the plants to ammate. There also seems to be little difference in susceptibility to ammate among the common sprouting species, although there is a difference in the ease with which the stumps can be girdled.

In contrast with chemicals formerly used, ammonium sulfamate is not toxic to animals nor is it inflammable. Ammate is somewhat corrosive to metal, however, and containers and applicators should therefore be rinsed thoroughly after ammate has been used in them.

Chemical killing of sprouting stumps has been used extensively and successfully in the construction and maintenance of firebreaks and roadsides in the forests of California. The method should be of economic utility for maintaining clearings around forest-guard stations, lookout towers, public campgrounds and smoking areas, under electric power lines, and along railroad rights-of-way. Ammonium sulfamate can be used to remove willows and alders from the banks of reservoirs, irrigation ditches, and flood-control channels. Householders find the method both cheap and positive for ridding their property of unwanted eucalyptus, redwood, and other sprouting species. For large-scale clearing of undesirable trees on range land the method is not cheap, but the application of chemical at the time of the original clearing, when trees are felled for wood, is convenient and insures valuable forage land against later encroachment of brush issuing from the old stumps. The advantage of eradicating stumps with chemicals has been repeatedly proved in forestry practice and with adequate attention to the requirements for careful application the method is both certain and economically practical.

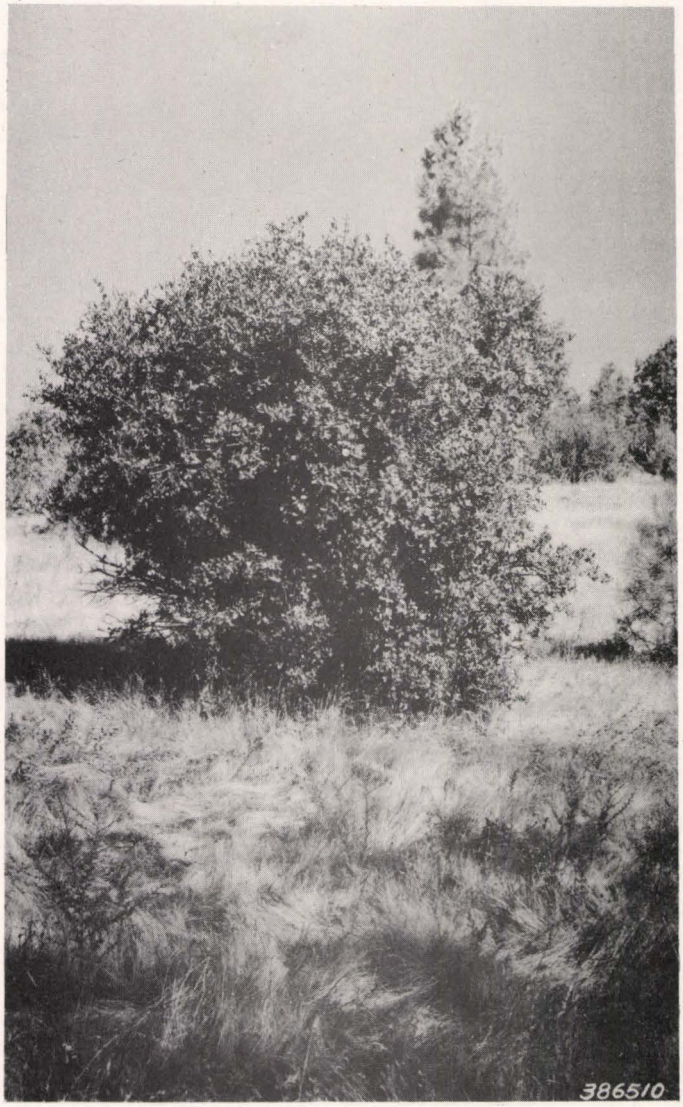

Figure 1. A sprouting live oak stump.

Figure 2. First operation: desprouting.

Figure 3. Second operation: unearthing.

Figure 4. Third operation: hacking.

Figure 5. Fourth operation: spraying the fresh cuts.

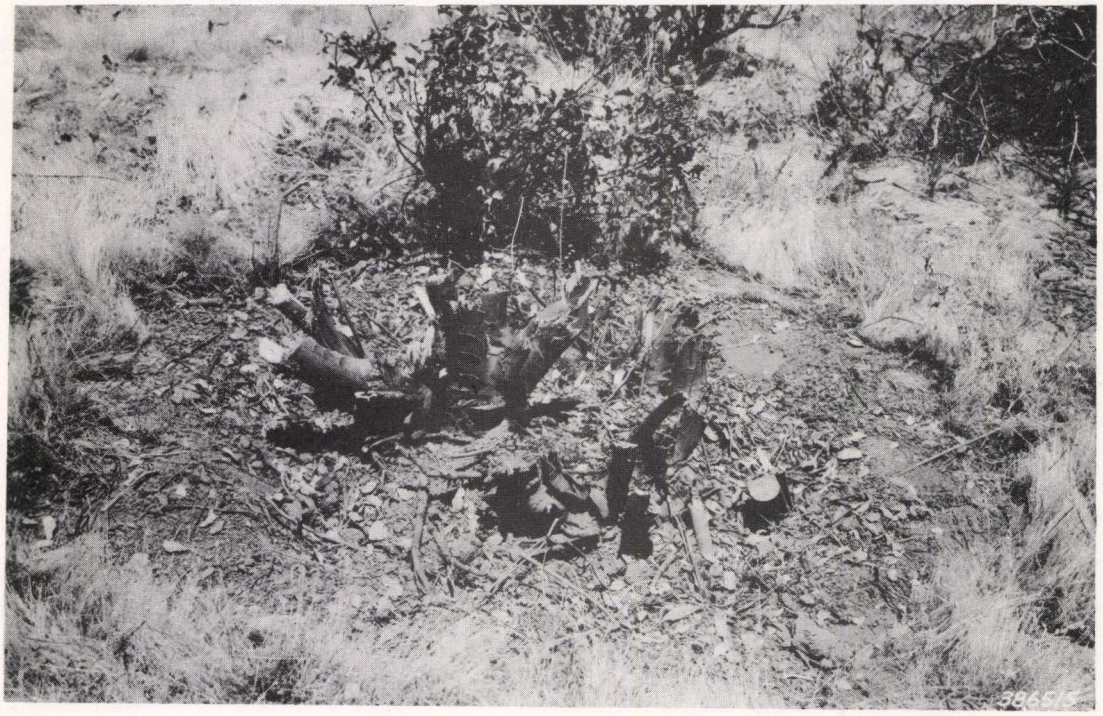

Figure 6. The treated stump a year later, completely killed by the single application.